(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 864 673 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
16.09.1998 Bulletin 1998/38

(51) Int. Cl.^{6}: D01F 1/10

(21) Application number: 97117592.2

(22) Date of filing: 10.10.1997

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV RO SI

(30) Priority: 14.03.1997 JP 82206/97

(71) Applicant: Ten Co. Ltd.
Nagoya-shi, Aichi-ken (JP)

(72) Inventors:
- Yayama, Toshihiko
Ogi-gun, Saga-ken (JP)
- Matsumoto, Etsuo
Tenpaku-ku, Nagoya-shi (JP)
- Noda, Kenichi
Mizuho-ku, Nagoya-shi (JP)

(74) Representative:
Strasse, Joachim, Dipl.-Ing. et al
Strasse & Hofstetter,
Balanstrasse 57
81541 München (DE)

(54) Wave absorbing fiber

(57) The wave-absorbing fiber is formed of the fiber material containing ferrite particles about 30 wt % that are shattered to pieces less than about 1 micro m in the size of the mean particle. The wave-absorbing fiber efficiently absorbs the injurious waves including the electromagnetic waves and generates the beneficial waves for organisms to improve the constitution of the organisms.

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a wave-absorbing fiber for absorbing the electromagnetic waves generated from several kinds of electronic appliances and the waves emitted from organisms including human bodies and for transforming them into the beneficial waves for the organisms.

Description of the Prior Art

The present applicant has found that the ferrite particles composed of nickel-zinc, etc. absorb the electromagnetic waves generated from several kinds of electronic and electric appliances such as cell phones, computers, etc. and the waves emitted from human bodies and that the ferrite particles also generate the beneficial waves for organisms. Accordingly, the present applicant has filed Toku-gan-hei 8-247303 in which a transformer for injurious waves is proposed that is made of dielectric synthetic resin containing the wave-transforming material about 30 - 95 wt%. The wave-transforming material contains ferrite powder as the main component. The transformer may be formed into a required shape to be attachable to a human body or electronic appliance, etc.

SUMMARY OF THE INVENTION

The present invention has been originated by making use of the above-described wave-absorbing action of the ferrite particles, and the object of the invention is to provide a wave-absorbing fiber which can improve the constitution of organisms by efficiently absorbing the injurious waves including electromagnetic waves and by generating the beneficial waves for the organisms.

Accordingly, the wave-absorbing fiber of the present invention is characterized in that the wave-absorbing fiber is formed of the fiber material containing ferrite particles about 30 wt % that are shattered to pieces less than about 1 micro m in the size of the mean particle.

The wave-absorbing fiber of the present invention can improve the constitution of organisms because the ferrite particles contained in the fiber material of the fiber absorb the electromagnetic waves generated from several kinds of electronic appliances and the waves emitted from organisms and also generate the beneficial waves for the organisms.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 is an enlarged partial front view of the wave-absorbing fiber according to the invention:

FIG.2 is an electron micro graph of the wave-absorbing fiber:

FIG.3 is a diagram showing the test example 1,

FIG.4 is a diagram showing the test example 2,

FIG.5 is a diagram showing the test example 3,

FIG.6 is a diagram showing the test example 4,

FIG.7 is a diagram showing the measured values by a magnetic resonance analyzing system,

FIG.8 is a diagram showing the test example 5, and

FIG.9 is a plan view of a wave-absorbing fiber of the second embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the accompanying drawings of the embodiments, the present invention will be described hereinafter.

The First Embodiment

In FIG.1 and FIG.2, the wave-absorbing fiber 1 contains ferrite particles 3 composed of necked-zinc, etc., which are shattered to pieces less than about 1 micro m in the size of the mean particle. The ferrite particles 3 are carried on fiber material 5, and in case the wave-absorbing fiber 1 is made up of the regenerated fiber such as rayon, etc., the fiber material 5 is composed of natural macromolecule material (regenerated fiber material) such as cellulose and protein, for example, for carrying the ferrite particles 3 in the low electric resistant condition. The wave-absorbing fiber 1 is formed in the following process.

Namely, the regenerated fiber material containing the solvent such as alcohol, caustic soda, etc. is shattered to pieces, and thereafter dissolved by adding sulfuric acid or the like. Then, the dissolved regenerated fiber material is added with the above-described ferrite particles 3 at the rate of about 30 wt% and, if necessary, added with several kinds of additives such as dye, pigment, fireproofing component, etc. Thereafter, the dissolved fiber material is degassed by sucking the mingled air with a vacuum apparatus or the like. Although this degassing treatment removes the bubbles from the fiber material 5, the ferrite particles 3 themselves hold innumerable bubbles on their rugged surface, so that a minute quantity of air remain around the ferrite particles 3 and forms the dielectric for absorbing electromagnetic waves or the like.

Next, the regenerated fiber material dissolved and transformed in high viscosity is solidified in the spinning solution such as sulfide acid by extruding through a nozzle with penetrated holes nearly equal to the size of the fiber to be formed, so that the wave-absorbing fiber 1 is produced.

Incidentally, the production method of the wave-absorbing fiber 1 from the fiber material 5 as regener-

ated fiber material is similar to the known production method of rayon, so that the detailed explanation of the method is omitted. As described above, the desirable adding quantity of the ferrite particles 3 is about 30 wt%. If it is below that, the wave-absorbing property of the wave-absorbing fiber 1 is decreased. On the contrary, if it is above that, the strength of the fiber is decreased or the fiber itself may not be formed.

In addition to the above-described regenerated fiber material, the fiber material 5 may be synthetic fiber material of poly amide, polyester or poly acrylic system. In this case, the melted polymer by heating over melting point in nitrogen is added with the ferrite particles 3 at the rate of about 30 wt% and, if necessary, added with several kinds of additives such as dye, pigment, fire-proofing component, etc. After stirred, the melted fiber material is solidified by extruding through a nozzle, so that the wave-absorbing fiber 1 is produced.

Incidentally, the production method of the wave-absorbing fiber 1 in case of synthetic fiber material as the fiber material 5 is similar to the known production method of synthetic fiber except that the melted polymer is added with the ferrite particles 3.

The wave-absorbing fiber 1 produced as described above is spun into thread, which is formed into a wave-absorbing fiber of a textile fabric; or the fiber 1 is gathered into a mat, which is formed into a wave-absorbing fiber of a non woven fabric. The wave-absorbing fiber of a textile fabric may be used as gauze, bandage, medical bed sheet, medical bedding, supporter, taping, table clothes for electronic appliances or the like; and that of a non woven fabric may be used as cushion material.

In case the wave-absorbing fiber produced as described above is used in medical treatment, the operation is as follows.

When there is a trouble in any organ of a human body, the affected part emits the (unbalanced) waves in the non resonance condition against the inherent wave environment, so that it comes to feel a pain; it is believed. When applied to such an affected part of a human body is the wave-absorbing fiber made up of the wave-absorbing fiber 1 as bedclothes, sheets of textile fabric or as mats of non woven fabric, the ferrite particles 3 contained in the wave-absorbing fiber 1 absorb the waves in the unbalanced condition of the wave environment emitted from the affected part and generate the new beneficial waves for the human body to apply them to the affected part. As a result, the waves from the affected part in the unbalanced condition are balanced into the inherent wave environment for the organ, so that the pain in the affected part is decreased.

Next, regarding the measurement of the pain-feeling pressure at the affected part before and after the use of the unwoven fabric formed into a mat by gathering the wave-absorbing fibers 1 according to the present embodiment, several test examples are shown as follows:

Test Example 1 (see FIG.3)

Affected part and name of disease: knee, rheumatism
Time for the use: 40 min.
Pain-feeling pressure before the use: 1.52 kg
Pain-feeling pressure after the use: 2.29 kg

Test Example 2 (see FIG.4)

Affected part and name of disease: knee, rheumatism
Time for the use: 40 min.
Pain-feeling pressure before the use: 0.35 kg
Pain-feeling pressure after the use: 1.02 kg

Test Example 3 (see FIG.5)

Affected part and name of disease: elbow, rheumatism
Time for the use: 40 min.
Pain-feeling pressure before the use: 1.80 kg
Pain-feeling pressure after the use: 2.40 kg

Test Example 4 (see FIG.6)

Affected part and name of disease: waist, rigid spondylitis
Time for the use: 40 min.
Pain-feeling pressure before the use: 0.50 kg
Pain-feeling pressure after the use: 3.17 kg

In any case, after the use of the unwoven fabric, the pain-feeling pressure was raised and it came hard to feel the pain.

Next, the action for absorbing injurious waves by the wave-absorbing fiber will be shown by use of a magnetic resonance analyzing system (MIRS). The magnetic resonance analyzing system is a known system to examine the existence of any disorder in the proper wave form of the weak resonant magnetic field emitted from the cells of a human body and to analyze whether the cells of the human body is in the normal condition or not. The condition of several organs of a human body is judged as shown in FIG.7 based on the measured values of the magnetic resonance analyzing system.

Test Example 5 (see FIG.8)

A suit of night clothes is made of the wave-absorbing fiber formed into a fabric from the rayon wave-absorbing fiber 1 containing the ferrite particles 3 at the rate of 30 wt%. The measured values by the magnetic resonance analyzing system are shown in FIG.8 of several organs of a human body in the conditions of wearing no night clothes, wearing no night clothes and using a cell phone, and wearing a suit of night clothes and using a cell phone.

From FIG.8, the following effects of the textile or the unwoven fabric of the wave-absorbing fiber 1 will be seen when they are used as a case for covering the cell phone. The ferrite particles 3 contained in the wave-absorbing fiber 1 absorb the electromagnetic waves generated from the cell phone to reduce the effect of the waves against the human body. Further, the ferrite particles 3 amplify the absorbed electromagnetic waves to generate the waves for improving the immune force or the like of several organs of a human body and recover the unbalanced wave environment of organisms due to the electromagnetic waves to increase the immune force or the like of the organisms.

Although the electromagnetic waves are mainly absorbed by the electromagnetic-wave absorbing action of the above-described ferrite particles 3 themselves, they are also absorbed by the dielectric loss according to the bubbles (air) because there are present minute bubbles around the ferrite particles 3 within the wave-absorbing fiber 1.

Incidentally, although in the above-stated description the several forms of the wave-absorbing fiber composed of the wave-absorbing fiber 1 as the material are listed such as medical sheets, medical bedding, supporters, taping clothes, and table clothes for mounting the electronic appliances, the present invention is not limited to the above-described use. In addition to such items, the wave-absorbing fiber may be formed in filters, cleaning fiber clothes, etc. for several organisms including water, for example.

The Second Embodiment

FIG.9 is a plan view of another embodiment of the wave-absorbing fiber. Although the wave-absorbing fiber in the first embodiment is formed in the textile or the unwoven fabric made up of the wave-absorbing fiber 1, the wave-absorbing fiber in the second embodiment is the paper 31 such as Japanese paper or foreign paper. Namely, the paper 31 is manufactured by adding to paper fiber 33 the ferrite particles 35 shatter to pieces between 1 - 50 micro m in the size of the mean particle. The adding quantity of the ferrite particles 35 to the paper fiber 33 is at the rate of about 30 - 50 wt%.

The above-described paper 31 as the wave-absorbing fiber has the same wave-absorbing action as in the above-described test examples 1 - 5.

Claims

1. A wave-absorbing fiber comprising the fiber formed of the fiber material containing ferrite particles about 30 wt % that are shattered to pieces less than about 1 micro m in the size of the mean particle.

2. A wave-absorbing fiber as defined in claim 1, wherein said fiber material is regenerated fiber material.

3. A wave-absorbing fiber as defined in claim 1, wherein said fiber material is synthetic fiber material.

4. A wave-absorbing fiber as defined in claim 1, wherein said fiber is formed into a textile fabric.

5. A wave-absorbing fiber as defined in claim 1, wherein said fiber is formed into a non woven fabric.

6. A wave-absorbing fiber comprising the paper formed of the paper fiber stuck with ferrite particles at the rate between about 30 and 50 wt % that are shattered to pieces between about 1 and 50 micro m in the size of the mean particle.

F i g. 1

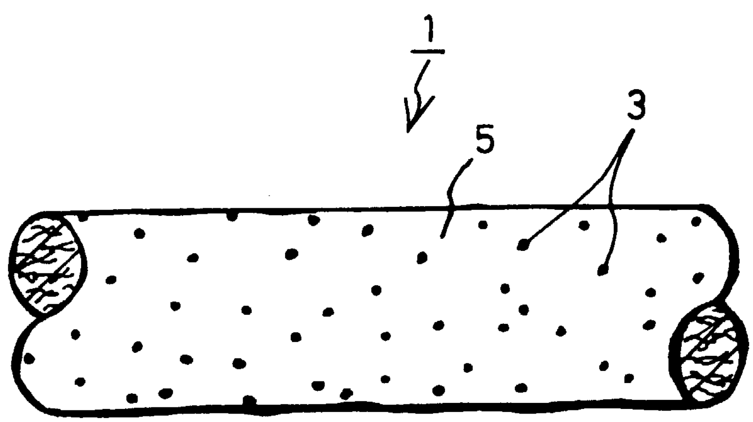


Fig. 2

Fig. 3

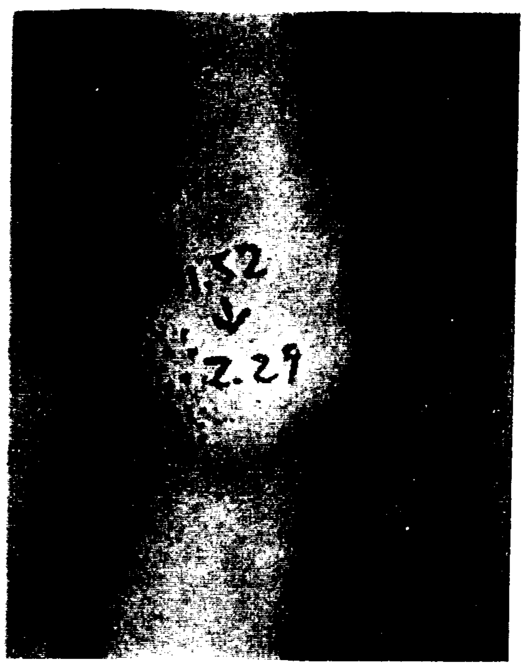


Fig. 4

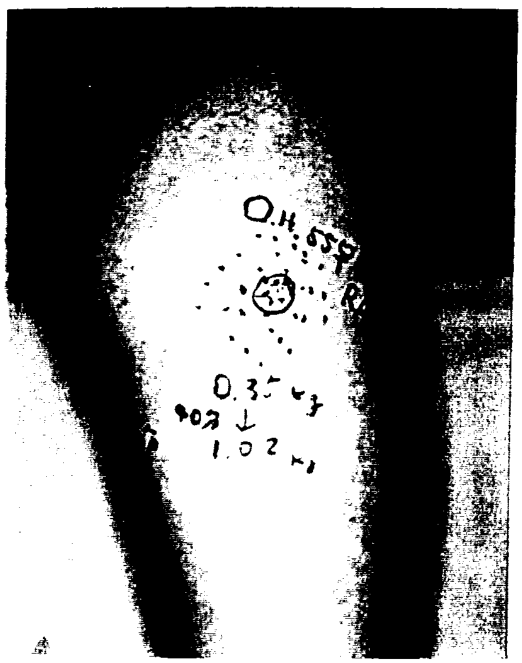


Fig. 5

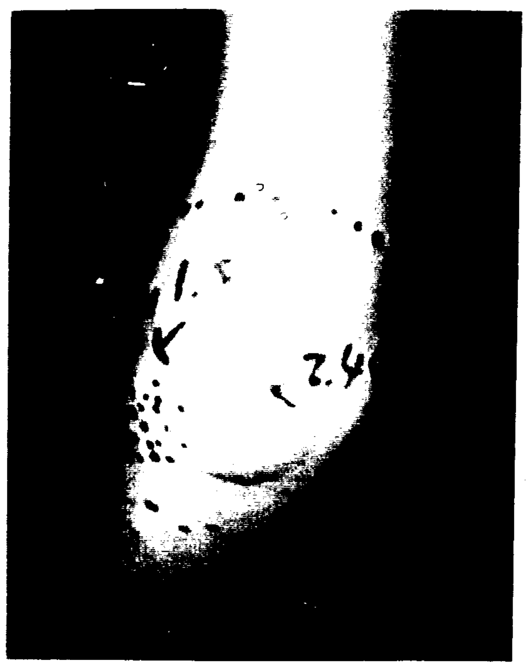
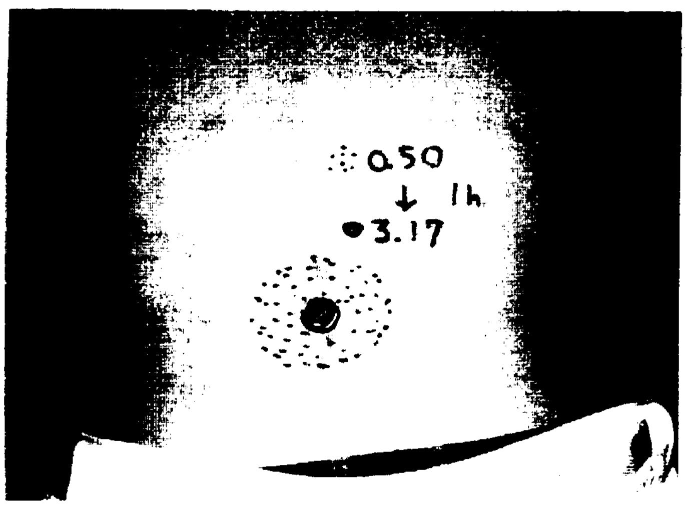


Fig. 6



F i g . 7

Measured value	Condition of organ
+15～+21	Very good
+10～+14	Good
+5～ +9	Rather good
−4～ +4	Neutral
−9～ −5	Rather bad
−14～−10	Bad
−21～−15	Very bad

Fig. 8

Organ	Non-wear	Non-wear & cell phone used	Wearing & cell phone used
Immunity	+15	+13	+19
Autonomic nervous system	+10	+10	+17
Sympathetic nerves	+12	+11	+14
Parasympathetic nerves	+12	+12	+14
Stress	+11	+11	+20
Hormone balance	+14	+12	+18

Fig. 9